

CLAIMS:

1. A method of making a stretched, multilayer  
breathable film having the combination of  
properties of:

- (i) providing a barrier to  
microorganisms; and
- (ii) providing a barrier to blood and  
bodily fluids;

said method comprising the steps of:

(a) simultaneously extruding at least a  
five-layer film from a die, said five-layer  
film having as a minimum the following  
structure:

C:A:B:A:C;

where B comprises a microporous core  
layer containing at least one thermoplastic  
polymer and at least one particulate filler;

C comprises an outer monolithic  
layer containing a hydrophilic polymeric  
resin capable of absorbing and desorbing  
moisture and providing a barrier to  
aqueous fluids and microorganisms, said  
C layer being substantially free of  
particulate filler; and

A comprises a microporous adhesive  
layer for bonding said C layers to said  
core layer B, wherein said C layer  
substantially prevents the buildup of  
particulate filler material on said die  
during said extrusion step;

(b) stretching said extruded five-layer film  
to thereby form micropores in said microporous  
core layer and said microporous adhesive layer,

wherein said stretching step is conducted and said microporous core layer and said microporous adhesive layers have been formulated so as to provide micropores which allow the passage of gaseous water but substantially prevent the passage of liquid water.

2. A method according to claim 1, further comprising the step of combining a portion of the components comprising said B layer with a portion of the components comprising said C layers to form an adhesive mixture, and said extrusion step comprises extruding at least one A layer containing said adhesive mixture.

3. A method according to claim 1, further comprising the step of collecting scraps of said formed multilayer breathable film and said extrusion step comprises extruding at least one A layer containing said collected scraps.

4. A method according to claim 1, wherein said extrusion step comprises extruding said layers in the following volume ratio:

about 1 to about 40% by volume for each A layer;

about 1 to about 96% by volume for said B layer; and

about 1 to about 30% by volume for each C layer, the volume % being based on the total volume of said breathable film.

5. A method according to claim 1, wherein said extrusion step comprises extruding said

layers in the following volume ratio:

about 1 to about 10% by volume for each A layer;

about 60 to about 96% by volume for said B layer; and

about 1 to about 10% by volume for each C layer, the volume % being based on the total volume of said breathable film.

6. A method according to claim 1, wherein said extrusion step comprises extruding said layers in the following volume ratio:

about 1 to about 5% by volume for each A layer;

about 80 to about 96% by volume for said B layer; and

about 1 to about 5% by volume for each C layer, the volume % being based on the total volume of said breathable film.

7. A method according to claim 1, wherein said extrusion and said stretching steps are conducted so as to provide a breathable film having a thickness of about 1 mil or less.

8. A method according to claim 1, further comprising the steps of determining the volatile content in the materials for making said microporous core layer and said microporous adhesive layers; and

adjusting the amount of volatiles in said materials to provide micropores having an average diameter of about 1/8 to about 1/2 the thickness of the stretched microporous core layer or

stretched microporous adhesive layers.

5 9. A method according to claim 1, further comprising the steps of determining the water content in said particulate filler for making said microporous core layer and said microporous adhesive layers; and

10 adjusting the amount of water in said materials to provide micropores having an average diameter of about 1/8 to about 1/2 the thickness of the stretched microporous core layer or stretched microporous adhesive layers.

15 10. A method according to claim 8, wherein said adjusting step comprises adjusting the amount of volatiles in said particulate filler to be within a range of about 100 ppm to about 500 ppm, based on the weight of said filler particulate.

20 11. A method according to claim 8, wherein said adjusting step comprises adjusting the amount of volatiles in said particulate filler to be within a range of about 100 ppm to about 300 ppm, based on the weight of said filler particulate.

25 12. A method according to claim 1, wherein at least one of said microporous core layer and said microporous adhesive layers comprises a metallocene catalyzed linear low density polyethylene.

30 13. A method of making a stretched, multilayer breathable film having the combination of properties of:

- (i) providing a barrier to microorganisms; and  
(ii) providing a barrier to blood and bodily fluids;

said method comprising the steps of:

(a) simultaneously extruding at least a three-layer film from a die, said three-layer film having as a minimum the following structure:

C:D:C;

where C comprises an outer monolithic layer containing a hydrophilic polymeric resin capable of absorbing and desorbing moisture and providing a barrier to aqueous fluids and microorganisms, said C layer being substantially free of particulate filler; and

D comprises a microporous adhesive core layer for bonding said C layers together, wherein said C layer substantially prevents the buildup of particulate filler material on said die during said extrusion step;

(b) stretching said extruded three-layer film to thereby form micropores in said microporous core layer and said microporous adhesive layer, wherein said stretching step is conducted and said microporous core layer and said microporous adhesive layers have been formulated so as to provide micropores which allow the combination passage of gaseous water but substantially prevent the passage of liquid water.

14. A multilayer breathable film having the of properties of:

- (i) providing a barrier to microorganisms; and
- (ii) providing a barrier to blood and bodily fluids;

said breathable film comprising at least five-layer film having as a minimum the following structure:

C:A:B:A:C;

where B comprises a microporous core layer containing at least one thermoplastic polymer and at least one particulate filler;

C comprises an outer monolithic layer containing a hydrophilic polymeric resin capable of absorbing and desorbing moisture and providing a barrier to water and microorganisms, said C layer being substantially free of particulate filler; and,

A comprises a microporous adhesive layer for bonding said C layers to said core layer B, wherein said C layer substantially prevents the buildup of particulate filler material on a die during formation of said multilayer breathable film, and wherein said micropores are constructed and arranged to provide the passage of gaseous water but substantially prevent the passage of liquid water.

15. A film according to claim 14, wherein at least one of said microporous adhesive layers comprises said thermoplastic polymer of said

microporous core layer and said hydrophilic polymeric resin of said monolithic layers.

5 16. A film according to claim 14, wherein said layers have the following volume ratio:

about 1 to about 40% by volume for each A layer;

about 1 to about 96% by volume for said B layer; and

10 about 1 to about 30% by volume for each C layer, the volume % being based on the total volume of said breathable film.

15 17. A film according to claim 14, wherein said layers have the following volume ratio:

about 1 to about 10% by volume for each A layer;

about 60 to about 96% by volume for said B layer; and

20 about 1 to about 10% by volume for each C layer, the volume % being based on the total volume of said breathable film.

25 18. A film according to claim 14, wherein said layers have the following volume ratio:

about 1 to about 5% by volume for each A layer;

about 80 to about 96% by volume for said B layer; and

30 about 1 to about 5% by volume for each C layer, the volume % being based on the total volume of said breathable film.

19. A film according to claim 14, wherein

said breathable film has a thickness of about 1 mil or less.

5 20. A film according to claim 14, wherein said microporous core layer or said microporous adhesive layers have been made by the steps of determining the volatile content in the materials for making said microporous core layer and said microporous adhesive layers; and

10 adjusting the amount of volatiles in said materials to provide micropores having an average diameter of about 1/8 to about 1/2 the thickness of the stretched microporous core layer or stretched microporous adhesive layers.

15 21. A film according to claim 14, wherein said microporous core layer or said microporous adhesive layers have been made by the steps of determining the water content in said particulate filler for making said microporous core layer and said microporous adhesive layers; and

20 adjusting the amount of water in said materials to provide micropores having an average diameter of about 1/8 to about 1/2 the thickness of the stretched microporous core layer or stretched microporous adhesive layers.

25 22. A film according to claim 14, wherein at least one of said microporous core layer and said microporous adhesive layers comprises a metallocene catalyzed linear low density polyethylene.

30 23. A film according to claim 14, wherein



said hydrophilic polymeric resin is selected from the group consisting of polyesters and polyamides.

24. A film according to claim 14, wherein said thermoplastic polymer comprises a polyolefin.

25. A film according to claim 14, wherein said thermoplastic polymer comprises a linear low density polyethylene.

26. A multilayer breathable film having the combination of properties of:

(i) providing a barrier to microorganisms; and

(ii) providing a barrier to blood and bodily fluids;

said breathable film comprising at least a five-layer film having as a minimum the following structure:

C:D:C;

where C comprises an outer monolithic layer containing a hydrophilic polymeric resin capable of absorbing and desorbing moisture and providing a barrier to water and microorganisms, said C layer being substantially free of particulate filler; and,

D comprises a microporous adhesive core layer for bonding said C layers together, wherein said C layer substantially prevents the buildup of particulate filler material on a die during formation of said multilayer

breathable film, and wherein said micropores are constructed and arranged to provide the passage of gaseous water but substantially prevent the passage of liquid water.

5

27. A film according to claim 26, wherein said layers have the following volume ratio:

about 1 to about 98% by volume for said D layer; and

about 1 to about 49% by volume for each C layer, the volume % being based on the total volume of said breathable film.

28. A film according to claim 26, wherein said layers have the following volume ratio:

about 80 to about 98% by volume for said D layer; and

about 1 to about 10% by volume for each C layer, the volume % being based on the total volume of said breathable film.

29. A film according to claim 26, wherein said layers have the following volume ratio:

about 90 to about 98% by volume for said A layer; and

about 1 to about 5% by volume for each C layer, the volume % being based on the total volume of said breathable film.

30. A medical gown comprising a multilayer breathable film according to claim 14.

31. A medical gown comprising a multilayer

~~B~~  
breathable film according to claim 25.

ADD C7